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January-June '52 Exports Total Cr. $12.8 Billion

Plan Vast Rio Port Program

4 More Piers Would Be Built, Each Over One Mile Long

Construction of four piers, each 1,680 meters long, capable of berthing ten deep-draft ships 450 feet in length, is the main feature of a plan for modernizing the port of Rio de Janeiro, now under study by Brazil's Department of Ports and Canals, according to Rio newspaper *Ultima Hora*.

Among Modernest

The plan, which may make Rio de Janeiro's port one of the most modern in the world, was drawn up by Engineer Ismael Coelho de Souza, of the Rio de Janeiro port authority. It calls for each of the four piers to have two rows of two-story warehouses, each measuring 100 x 35 meters, and having a capacity of 10,000 tons.

Road, Rail Facilities

A road traffic thoroughfare 40 meters wide is to be provided between the two rows of warehouses, and one each side of the piers there will be a strip 25 meters wide for sidings to be linked up with the internal port railroad system and the railways serving the port.

The plan will provide Rio with an extra 10,450 meters of deep quayside berthing space for vessels, thus more than doubling the present figure of about 6,000 meters.

Total warehouse space will be 581,000 square meters, and there will be 277,000 square meters of space for cargo handling and

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Brazil's Ambassador is Honored

At a luncheon given by the American-Brazilian Association, Brazilian Ambassador Walther Moreira Salles was presented by the Association with a scroll, in recognition of his efforts on behalf of democracy and closer understanding between Brazil and the U. S. Left to right: Mr. Nelson Rockefeller; Brazilian Consul-General J. B. de Berenguer-César; Mr. Berent Friele; Ambassador Walther Moreira Salles; Mr. L. C. Irvine, President of the American-Brazilian Association, and Ambassador João Carlos Muniz, Head of Brazil's delegation to the U.N. Photo by courtesy of IBM World Trade Corp.

Report Extensive Natural Rubber Production Starting in São Paulo

Large scale rubber production is expected to start shortly in São Paulo, on a plantation which has some 2,700 trees ready for tapping, according to reports disclosed in the Rio press.

The São Paulo plantations are located at Fazenda Santa Sofia, in the locality known as Bôa Esperança do Sul.

The total number of rubber trees under cultivation is stated to be about thirty thousand.

The proprietor of the plantations, Mr. José Procópio Araújo Ferraz, has applied to the Campinas Agricultural Institute for rubber specialists to test the productive capacity of the trees, which are now six years old.

The seeds are said to have been imported from Libéria, and the latex obtained from the trees is claimed to be better than that from the Alto Acre region, which is among the best in the world.

Rice, Thread & Ores Boom

Coffee Earned Cr.$8.9 Billions, Equivalent to About $440 Million

Brazil exported goods to the value of 12,881,922,000 cruzeiros, during the first six months of 1952, according to figures published in *Diário de São Paulo* and attributed to the Economic and Financial Statistics Service of the Ministry of Finance.

The bulk of these exports was composed of coffee shipments which, at a value of 8,939,942,000 cruzeiros, accounted for about 69.4 percent of the total, the statistics reveal.

Significant among the figures published were those for rice, cotton thread and iron ore, all of which items showed marked increases.

Rice exports, which amounted to 203,922,000 cruzeiros for the January-June period of 1951, were hiked to 426,329,000 cruzeiros, an increase of about 109 percent.

This increase brought rice up from the eighth position which it occupied in the 1951 statistics, to third place this year, being surpassed by coffee and cotton alone.

437% Increase!

Cotton thread exports were boosted 437 percent, from a value of 78,987,000 cruzeiros in the first half of 1951, to a figure of 424,373,000 cruzeiros for the same period of this year. Cotton thread thus rose from nineteenth place in the 1951 statistics, to fourth place this year.

Iron ore shipments boomed to 186,229,000 cruzeiros, a 135 per-

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Vast Rio Port Plan Described

Coal and Ore Handling Facilities Would Be Boosted

(*From Page* 1)

more than a million square meters of available room for storage of heavy lifts and for railroad sidings.

The project calls for construction of the first pier to commence immediately after the conclusion of the sea wall for the coal and ore quay between warehouses Nos. 25 and 26 of the present port installations.

1,340,000 Tons a Year

After the first pier is ready, Rio will be able to receive more than 1,340,000 tons of cargo a year, according to *Ultima Hora*, thus greatly speeding up despatch of cargo and ship handling.

One feature of the Rio port plan calls for a public bid to be opened for construction of 600 meters of quay for unloading coal, and a temporary pier for shipments of manganese and iron ores, it is understood.

The work is to be assisted by a heavy dredger, specially sent from Europe for the purpose, and reclamation work is expected to be ready within about six months.

Store 1,400,000 Tons Coal

The project would provide for a coal storage capacity of 1,400,000 tons and the discharging equipment would be adequate to unload a 12,000 ton cargo vessel in only eighteen hours.

Ore loading equipment would be adequate to work at a rate of 1,000 tons an hour per vessel, thus allowing ships bringing coal to load up with ore after discharge. A thirty-hour loading period for 12,000 ton ships is estimated.

It is believed that, after the conclusion of the coal and ore quays, the port of Rio would be able to handle a total of four million tons of ore exports a year, besides providing for one month's stockage of coal for Brazil's steel mills and railroads.

Rio Cultural TV Said South America First

Sign for Roquette Pinto TV

Signing contract for the supply of DuMont equipment for Rio's Roquette Pinto cultural and educational television station are, left to right: Dr. Fernando Tude de Souza, director of the station, Mr. Ernest A. Marx, director of DuMont's International Division, and Colonel Lauro A. Medeiros, consulting electronics engineer.

Telecasting Will Begin Early '53

VHF TV Transmitter and Other Equipment is Made by DuMont

Radio Roquette Pinto, educational station of the Rio de Janeiro Municipality, plans to also start telecasting operations early in 1953, according to Dr. Fernando Tude de Souza, Director of the station. Present plans call for the station to be used primarily for cultural and educational purposes in Brazil's capital city.

"The establishment of this television station," declared Dr. Tude de Souza, "marks a cultural victory for Rio de Janeiro, in that it is the first purely educational and cultural television station in South America."

Delivery Begins Soon

The VHF (Very high frequency) television transmitter, full studio equipment and a mobile unit for remote telecasts, are to be supplied by Allen B. du Mont Laboratories, Inc., and delivery of the equipment will commence shortly, according to Ernest A. Marx, Director of Du Mont's International Division.

Negotiations for the purchase of the equipment were carried out with Dr. Tude de Souza, and his consulting electronics engineer, Colonel Lauro A. Medeiros. Dr. Tude de Souza, who is professor of radio at the university of Rio de Janeiro, is also Brazil's representative on the UNESCO, United Nations Educational, Scientific and Cultural Organization.

Arrangements for the erection of the Station are a direct result of cooperation on the part of Rio's Mayor João Carlos Vital, working in conjunction with the City Council of Rio de Janeiro.

Announced plans by the Rio de Janeiro municipality call for the erection of the finest station in South America, to serve as a model for future television installations in that area. A new building is rapidly being finished, it is disclosed, for the purpose of housing the new station equipment.

Carbon Black may be Made in Brazil

Carbon black, essential to manufacture of rubber products, may soon be produced in Brazil, Belo Horizonte's *Informador Comercial* discloses.

Recent visitors to Brazil were Mr. David D. Cockrane and Mr. Louis V. Cabot, of the firm of Godfrey L. Cabot, Inc., who came at the invitation of the Brazilian government to study possibilities of establishing a carbon black factory in the country, the newspaper reveals.

Brazil's rapidly expanding rubber industry at present consumes some 8,000 tons of the product a year, costing about $2,000,000.

The representatives of Messrs. Godfrey L. Cabot visited São Paulo, center of Brazil's rubber products industry, to study consumption possibilities and a possible location for the proposed factory, it is reported.

Ore Booms; U.S.A. Gets Most Coffee

(*From Page* 1)

cent hike over the 79,322,000 cruzeiros registered in the corresponding 1951 period. Iron ore was eighth on the list of exports, whereas it had been eighteenth last year.

A percentual breakdown of coffee shipments, by continents, recently published by the Brazilian press, showed the following approximate results:

Continent	*Thousand Cruzeiros*	%
North America	5,408,000	60.5
Europe	2,987,000	33.5
So. and Central America	280,700	3.1
Asia	163,500	1.8
Africa	100,000	1.1
Total	8,939,900	100.0

A general breakdown of exports, by tonnage and cruzeiros value, is given on page five of this issue.

Outline Santos Harbor Program

Joint Comm. Project Calls for $3.6 Million Loan for Improvements

A project for the improvement of the port of Santos, calling for a dollar loan of $3,674,300, and involving a Brazilian currency expenditure of 349,364,000 cruzeiros, presented by the Joint Brazil-U.S. Commission, recently received the sanction of President Getúlio Vargas according to "*O Estado de São Paulo.*"

Drawn up with the cooperation of Brazil's National Department of Ports, Rivers and Canals, and the Santos dock company, the project includes the following items calling for dollar payments:

6 Salient Items

1. Reconstruction of three warehouses alongside the quay: $296,000.

2. Structures for three external warehouses; $197,500.

3. Equipment for wheat silos: $543,000.

4. Equipment for bulk handling of fertilizers and sulphur: $444,000.

5. Purchase of mechanical equipment for port operations: $1,091,300.

6. New electric power installations: $263,000.

President Approves

President Vargas, in approving the plan, made the following annotation: "This project fits in with the general port re-equipment plan, and it will contribute to the elimination of port congestion, and to speed of handling of the agricultural and industrial production of a vast region of Brazil." He pledged government measures to guarantee financing in foreign currency.

The significance of this project stems from the fact that the port of Santos, in addition to serving Brazil's greatest industrial city, São Paulo, is directly connected by railroad with the North of Paraná, the "Triangulo Mineiro", (rich agricultural region of the state of Minas Gerais), the State of Mato Grosso and the South of Goiaz.

Inventor Makes Cellulose from Bananas

UN Delegate Addresses Society

At its latest meeting, the Brazilian Cultural Society heard a talk by Mr. Roberto Marinho, of Brazil's U.N. delegation, on Brazil's rôle in world affairs. Left to right: Consul-General J. B. de Berenguer-César, Mr. Roberto Marinho, Mr. Arthur Coelho, president of the Cultural Society, Mr. José Bettencourt Machado, Assistant Director of the Brazilian Government Trade Bureau, and Mr. Leon Bensabat.

Brazilian, Foreign Exhibitors are Welcomed to S. Paulo Trade Fair

Applications from prospective exhibitors in São Paulo's Fourth Centennial International Trade Fair (see *Brazilian Bulletin* No. 210, September 15th) must be in the hands of the organizing commission by June 30, 1953, according to information published by the American Chamber of Commerce in São Paulo.

Upon registration, exhibitors will be required to deposit 10 percent of the value of the site selected, it is added, in accordance with appropriate prices and conditions. Such sites will be located in São Paulo's Ibirapuera Park.

Both foreign and Brazilian exhibits are welcomed by the organizing Commission, and they may be presented by manufacturers, representatives or distributors, trade groups, chambers of commerce, and state or inter-state public organizations.

All exhibition material must be sent to the Commission, together with a report (in duplicate) on the shipment and its contents, namely, type of article, value and any other information necessary to identify it. General descriptions should be avoided.

The shipments are required to be labelled "Exposição Internacional de São Paulo," and to carry the exhibitors name as well.

Inquiries concerning the trade fair might be addressed to:

Comissão dos Festejos do
IV Centenário da Cidade
de São Paulo

a/c Eng. Carlos Brasil Lodi
Departamento de Urbanismo
Da Preseitura Municpal
Rua Florencio de Abreu, 79
São Paulo, Brazil

At the close of the Fair itself, the Chamber of Commerce dicloses, there will be a sales fair lasting thirty days, when exhibits will be sold at established prices.

Foreign exhibitors, whose products entered the country duty free, will pay duty according to Article 15 of Decree 24163 (April 24, 1934), if those products are sold, and such sales will be subject to a 3 per cent tax for the benefit of the trade fair.

Brazilian Process is Patented in UK

Studied by Geographic and Statistical Institute

The 24 million stems of bananas which São Paulo produced last year could have been a potential source of about 110,000 tons of cellulose, according to The Brazilian Chamber of Commerce of Great Britain.

A method of extracting cellulose from the stalks of banana trees by a process known as Polpex was recently studied by the Brazilian Geographic and Statistical Institute, the Chamber discloses.

The process, evolved after prolonged experiments and patented in Great Britain by Dr. Francisco Garcia Leão, calls for the reduction of the banana stalk to bagasse, which is 90 percent cellulose. Impurities in the cellulose are destroyed by the use of 3 to 5 percent solutions of products made in Brazil. The patent has been transferred to a Brazilian firm, Cia. de Cellulose Banex, which has exclusive right to use it in Brazil.

Equipment Made Locally

The simple machinery and accessories required are made in São Paulo and the Federal District, and the cost of equipping a factory is estimated to be about 85 percent less than that for the extraction of the same quantity of cellulose from wood.

The Federal Council on Foreign Trade considered the Polpex process the most suitable for Brazil, and recommended financial assistance for the establishment of the industry in Rio or São Paulo, it is added.

Each stalk of the banana tree contains about 3.5 kilos of cellulose. A production of 10 metric tons a day would therefore call for 75,800 stalks per year of 300 working days. Allowing 400 trees per hectare (2.47 acres), the area of the plantation, including buildings, needed to keep the factory supplied, would be 200 hectares.

Central Railroad Gets Diesel Electric Locos

1st Two Baldwin Units Arrive Rio

Delivery of Complete Order Scheduled for 1st Qtr. '53

Recent arrivals in Rio were the first two of 32 Baldwin Westinghouse locomotives ordered by the Central do Brazil railroad, as a part of its program to extend diesel-electric operations to key sections of its lines.

The two locomotives were dedicated at ceremonies held at the Dom Pedro II terminal in Rio de Janeiro, by Brazil's Minister of Transportation Souza Lima, Senator Napoleão Alencastro Guimarães, and Colonel Eurico de Souza Gomes, Director of the railroad.

Step-up Power 5 Times

These locomotives are five times as powerful as the first Baldwin-built locomotives delivered to the Central do Brasil railroad in 1862, Westinghouse Electric International Co. states.

They weigh 170 tons and are rated at 1,600 horse power. Their continuous tractive effort is 72,900 pounds.

The railroad will receive twelve of the 170-ton units, to operate on broad gauge track (63 inches), and twenty 118-ton units, designed for meter gauge track.

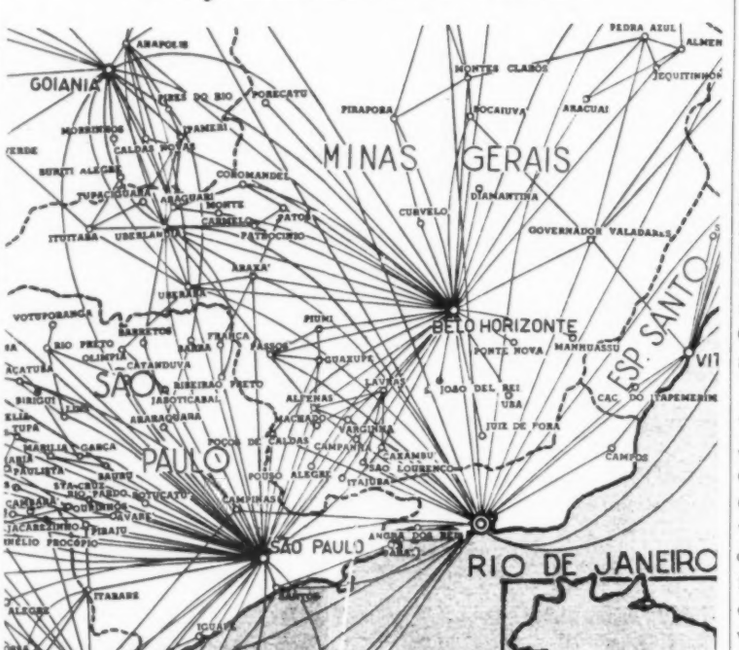
Delivery Speeded

The first two units are understood to have been delivered about six months ahead of time. Delivery of all units is scheduled to be completed during the first quarter of 1953.

Baldwin-Lima-Hamilton Corporation, of Eddystone, Pennsylvania, is building the mechanical parts and assembling the locomotives, and the complete electric traction units are being made by Westinghouse, at its East Pittsburgh, Pa., plant.

These units will replace steam locomotives previously used on the Central's lines, and a reduction in operating costs is expected, besides greater operating efficiency.

Busy Airlanes of Brazil



This map segment shows domestic airlines in Central and South Brazil. Note the key rôles played by São Paulo, Rio de Janeiro, Belo Horizonte and Goiania, as transport hubs from which a close network of connections with surrounding cities radiates.

Rio Dôce Iron Ore Exports Earn $14 Million in Jan. - Aug.

Cia. Vale do Rio Dôce earned $14,610,118 in dollar exchange for Brazil during 1952, up to the end of August, and established a new record in the month of August by extracting a total of 179,923 tons of ore, the American Chamber of Commerce in São Paulo discloses.

These dollar earnings are almost double the $7,494,624 earned during the corresponding period of 1951, and almost five times more than the figure for the January-August period of 1950, which was $3,042,091.

Total tonnage shipped out, through the end of August, amounted to 936,556 tons.

The company's president Jurací Magalhães also reported favorable progress on the repayment of three outstanding loans from the U.S., stating that the total amount, which had stood at $26,269,077, as of the end of 1950, was down to $22,599,648 by August 31st this year.

So far, Cia. Vale do Rio Doce has paid the U.S. $3,900,351 in amortization of the loan, and $7,103,760 in interest payments. All payments, said President Magalhães, have been made on the due dates.

The company is reported to be paying close attention to railroad improvements, since a good roadbed had been one of the major requirements for efficient operation. The entire route of the Vitoria-Minas Railway (Estrada de Ferro Vitoria-Minas) is now expected to be in efficient working condition by next June.

Draft Leopoldina RR Improvements

Efficiency is Aim of an Extensive Program

Laying of 1,100 kilometers of new 90-pound rails, replacement of 360,000 sleepers and installation of 200,000 new sleepers, are highlights of the plan to boost the efficiency of Brazil's Leopoldina Railroad, now operated by the Federal Government, Rio's *Diário de Notícias* discloses.

The improvement program, which is covered by a project of the Joint Brazil-U.S. Commission, is expected to take about six years to complete. It should go far to converting the railroad into a modern, efficient means of communication, in accordance with the directives of President Vargas' government, which lays much stress on improvement of transport facilities as an aid to its policy of production increase.

The tendency towards a constant increase in the weight of rolling stock used, and the adoption of diesel-electric locomotives, with a loading of about 16 to 17 tons per axle, lead the Leopoldina's engineers to recommend the use of the 90-pound rails in the re-equipping of the line, *Diário de Notícias* points out.

Improve Vitoria Service

An important feature of the rehabilitation plan is the doubling of the line between Visconde de Itaboraí and Porto das Caixas, to provide complete independence of traffic over the Nova-Friburgo-Manhuaçú line from traffic over the lines to Vitória, of constantly increasing importance as the Vale do Rio Dôce iron ore port.

The railroad's stone crushing quarry units are to be improved and new units installed, for a planned output of sixty thousand cubic meters of crushed stone per unit each year.

Special automatic-discharging gondola cars are to be used in conjunction with the crushing units, for ease of transport of the crushed stone to points of utilization on the line bed.

Stress Value of Diesels in Brazil

Seen Useful Aid to Savings in $$

Ouricurí, Cottonseed and Castor Oils Called Effective Fuels

Experiments recently made with diesel-powered trucks, in Brazil, have shown that the country's ouricuri oil, castor oil and cottonseed oil were all satisfactory fuels for this type of power, discloses journalist Frank Arnau, writing in Rio de Janeiro's *Correio da Manhã*.

Use of diesel power might, the writer argues, be one solution to the heavy exchange expenditure involved in importing ever-increasing quantities of fuels to power Brazil's expanding economy.

Display Diesel Economy

Furthermore, tests carried out with gasoline-powered and diesel-powered trucks on the "Presidente Dutra" superhighway, showed that 15- and 18- ton diesel units cost but 2.9 and 2.7 Brazilian centavos per ton-kilometer, as compared to 10.9 and 9.8 centavos, respectively, for 6-ton and 10-ton gasoline-powered trucks.

The theoretical total saving afforded if diesel-powered trucks were in use instead of gasoline-powered trucks in Brazil, says *Correio da Manhã*, would be as high as 7.5 million cruzeiros an hour (about 380,000 dollars).

The greater saving where diesel power is used instead of gasoline power, points out writer Arnau, arises not only from the lower cost of diesel oil, which he estimates at about half, but also from the lower consumption of the diesel motor, which, he says, has a thermal efficiency of about 35 percent, as compared to the gasoline motor's 22 percent.

The importance to Brazil of savings on fuel can be realized in the light of the fact that, last year, the country spent a total of 3,739,000,000 cruzeiros (about 180 million dollars) on fuel imports, and that this consumption was more than 47 percent higher than that for the previous year.

"Personality Girl" of Brazil Radio

Brazil's Alzirinha Camargo, beautiful, talented and refined, is well known in the U. S. A brilliant singer of popular songs, and a paragon of good taste, she has been the "toast of Broadway" on more than one occasion. Photo by courtesy of American-Brazilian Association.

Leading Brazil Exports, Jan. - June

Products	*Tons*	*Thousand Cruzeiros*	*Percentage of Total Value*
Coffee	444,169	8,939,942	69.4
Raw cotton	19,688	461,625	3.6
Rice	145,670	426,329	3.3
Cotton threads	3,480	424,873	3.3
Pinewood	238,781	370,841	2.9
Sisal fibers	26,638	233,953	1.8
Cocoa	18,672	225,096	1.7
Iron ore	643,367	186,229	1.5
Carnauba wax	5,185	160,309	1.2
Bananas	109,653	129,655	1.0
Castor oil	13,747	127,492	1.0
Hides	9,568	89,108	0.7
Other products	306,764	1,106,480	8.6
Total	1,985,387	12,881,922	100.0

Synthetic Fiber Output Boosted

Hi-Tenacity Tire Cord Stressed; May Have Some for Export

Brazil produced 13,400 metric tons of rayon and acetate fibers during the six month period ended August 1952, a boost of about twenty percent over the figure for the previous six month period, *Foreign Commerce Weekly* discloses.

Particular emphasis has been given to high tenacity tire cord. One factory is at present producing this cord and two more are expected to start operating late 1952 or early next year.

Plans call for an eventual output of 12,000 metric tons a year, which should be sufficient to provide for all of Brazil's own requirements in tire manufacture, and permit some exports as well.

Commercial production of acetate staple was commenced early in 1952 on a small scale, but will be increased considerably by the end of the year.

Non-Cellulose Fiber

A new development in São Paulo is the production of a non-cellulose fiber, similar to nylon, using castor oil as a basic raw material, and a factory is now under construction, for the industrial application of this process.

In addition, another firm has been authorized to produce nylon, under a patents agreement with Du Pont (see *Brazilian Bulletin* No. 204).

Brazil's synthetic fiber industry still is dependent upon foreign sources for some of the machinery, accessories and dissolving wood pulp it needs. However, plans are progressing for the manufacture of high grade cellulose from eucalyptus trees, and other local sources of cellulose have likewise been studied.

One source of cellulose that might well repay industrialization studies is the residues of the sisal plant, principally used as a supplier of hard fiber, and which grows in millions in the North-East of Brazil, especially the State of Paraiba (see article on page 7 of this issue).

Census Highlights Paraná's Industrial Growth

805% Boost in 10-Year Period

São Paulo's Industry Maintains Dominant Position

The number of industries in the State of Paraná increased by 805 percent during the ten-year period, 1940-1950, and the number of industrial workers in the state was upped by 917 percent during the same period, according to data recently released by Brazil's National Census Service, and reported in *Diário de São Paulo*. This was the highest rate of increase for any state in Brazil.

Paraná had 20,451 industries, according to the 1950 census, as compared with the figure of 2,264 for the previous census, in 1940. Industrial employees numbered 38,243 in 1950, as against 3,762 in the former census year.

Brazil as a whole had an increase of 80 percent in the number of industries, from 49,418 in 1940, to 89,086 in 1950. The total number of industrial workers increased from 781,185 to 1,236,807, a hike of around 61 percent.

The State of São Paulo had 24,519 industries operating in 1950, a rise of 72.5 percent over the 1940 figure. It maintained its place as the largest industrial concentration in the country, with 484,844 industrial workers engaged in production. The Federal District was next in order of importance, and showed a total of 165,957 industrial workers.

Significant increases were also shown by the State of Minas Gerais, whose industrial labor force rose from 74,267 in 1940 to 110,477 in 1950, and the State of Rio Grande do Sul, with a boost from 60,908 to 99,026 workers.

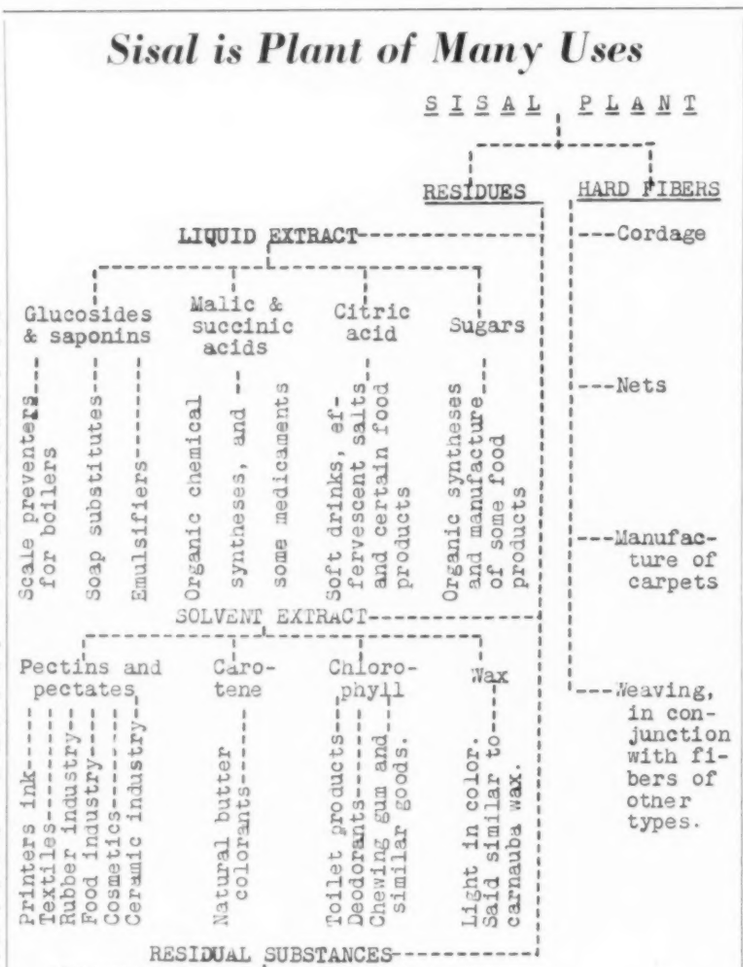
The increases tended to be rather higher in the case of some of the outlying states, which may reflect a tendency, commented on in a recent issue of *Estado de Minas*, for both Brazilian and foreign capital to get closer to sources of raw materials, with a view to lowering the cost of production.

The statistics showed São Paulo maintained its outstanding industrial position, however, with an increase of 619 percent in value of production over the ten-year period 1940-1950. Production in 1950 was valued at 54.6 billion cruzeiros, compared with 7.6 billion in 1940.

The textile industry maintained the lead in volume of production, and its output boomed from 2.1 to 11.7 billion cruzeiros.

A greater actual rate of increase was, however, shown by the metallurgical industry, whose 1940 production, valued at 409 million cruzeiros, leaped to 4.1 billion in 1950, a more than tenfold rise. The paper industry's output was boosted almost as much—from a value of 129 millions to 1.26 billion.

Sisal is Plant of Many Uses



This chart, based on details published in Rio's *Fôlha Carioca*, shows that the sisal plant, besides providing hard fibers, is a potential source of many chemicals, as well as a type of wax, cellulose (vital to Brazil's paper industry) and lignin, for composition building boards. Please see article on page 7.

Modernize Brazil Ceramics Factory

Install 400-Foot Tunnel Kiln at Martini, S.A. S. Paulo Plant

An automatic ceramic products factory, with a four-hundred foot long "Allied" tunnel kiln was recently inaugurated by Ceramica Martini, S.A., a forty-year-old concern operating at Mogi-Guassú, in the State of São Paulo, *Diário de São Paulo* discloses.

The Martini plant makes about 120 tons of finished products a day, between 1.5 meter glazed earthenware pipes, four to 24 inches in diameter, tiles, bricks and molded earthenware accessories.

Use Brazilian, U.S. Equipment

Part of the factory's equipment was imported from the U.S.A., and the remainder made in Brazil, to U. S. specifications, it is mentioned.

The clay is dug by a mechanical shovel, and transported entirely by conveyor belts. Overhead cranes are extensively used within the factory for handling raw materials and finished products.

The natural drying system formerly used has been replaced, in the new factory, by a drying oven with twenty hot air chambers.

Automatic Vitrification

The vitrifying layer is applied by means of groups of automatic compressed air pistols, and after spraying, the products are carried through the tunnel kiln by a series of sixty cars. The temperature of the kiln, which operates on a continuous basis, is controlled with precision by modern pyrometric methods.

This plant, a typical example of the progress being achieved by introduction of modern industrial methods in Brazilian industry, says *Diário de São Paulo*, occupies but 7,000 square meters of floor space, for a daily output of 120 tons, whereas formerly 22,000 square meters were used for an output of 45 tons.

Sisal Waste Seen Source of Industrial Products

Processing of Its Residues Might Be Good Investment Opportunity

The sisal plant, whose hard fibers are today Brazil's sixth export product in order of value, and have earned the country upwards of a billion cruzeiros in foreign exchange in the past three and a half years, could bring further benefits to Brazil through industrialization of the waste from its leaves, according to details published in *Fôlha Carioca*, Rio de Janeiro newspaper.

Experiments carried out in England as long ago as 1939 showed that practically the whole of the waste material from the sisal leaves has a useful application, the newspaper points out.

This knowledge is today being put to practical use in factories being established in England and Kenya (British East Africa).

Among the industries that can use products derived from sisal waste are the soap, solvent, drug, food and cosmetics trades, textile mills, ceramic plants, plastics factories, and many of the chemical products obtained from the plant are useful in chemical organic syntheses.

The so-called sisal waste consists of the green husk of the plant, and the pulp from the leaves.

This waste produces three chief classes of products, a liquid extract, a solvent extract and residual substances.

1) *Liquid extract.* This contains malic, succinic and citric acids, glucosides, sugars and saponins.

The first two products are used in some medicaments, as well as in organic syntheses.

Citric acid is widely employed in effervescent salts, soft drinks and many food products.

The glucosides are used in compounds for inhibiting scale formation and corrosion in boilers, and the saponins are valuable emulsificants, foam producers and soap substitutes.

This aspect of the utilization of the by-products is as yet in its initial stage of development, according to *Fôlha Carioca*.

2) *Solvent extract.* The solvent extract contains about 1 gram per leaf of a wax which, when purified, is light in color and is said to be similar to carnaúba and suitable for much the same purposes.

This extract is also a source of chlorophyll, and might thus serve as a basis for a flourishing industry similar to that which has undergone such spectacular expansion in the United States in recent years.

Carotene, also present in sisal residues along with chlorophyll and xanthophyll, is used as a natural food colorant for butter and cheese.

Of almost equal importance to the foregoing products are the pectins and pectates, found in the solvent extract, which have wide application in the food industry, and are used to thicken soups and for the gelatinization of milk products.

In cosmetics, these pectates are used for beauty creams, hair fixatives, as well as being employed in certain pharmaceutical products.

They substitute alginic acid, acacia, starch and other traditional ingredients.

The pectates also find application in the processing of rubber latex and in making sponge rubber.

They can be used to give consistency to paper, and are one of the ingredients of printing ink.

In the ceramic industry, they are used as colloidal protectors for the fixation of the paste.

The last, and perhaps the most important application of the pectates from the sisal waste, however, is said to be in the textile industry, where they are basic to the manufacture of thread. Filaments produced with pectin can be spun direct, according to a study published in *Observador Economico e Financeiro* of Rio de Janeiro, or can be used to cover other threads, as in the manufacture of woollen threads, which, by this method, can be made more beautiful and softer.

3) *Residual substances.* These include cellulose, lignin and pentosans.

Extraction of cellulose could be a particularly profitable and useful activity, in view of Brazil's expanding paper industry, which last year imported some 115 thousand tons of cellulose.

A sign of the attention being given to cellulose production in Brazil is the strenuous efforts being made in São Paulo to extract cellulose from the eucalyptus tree, and the recent patented process for extracting cellulose from bananas (see page 3 of this issue).

The lignin can be molded direct into a number of readily-saleable articles, according to *Fôlha Carioca*, or can be used as a filler for plastics, an interesting application, in the light of Brazil's rapidly-growing plastics industry.

Lignin is also capable of being molded into composition boards, which would have useful application in the building industry, scheduled to undergo a tremendous boom in the very region where the sisal grows so abundantly.

This is because of Brazil's vast Paulo Afonso hydro-electric power development, destined to build up economy of the entire North-East region of Brazil.

Other valuable industrial products extractable from the residual substances are furfuraldehyde, an important starting point for many organic syntheses, and acetic and butyric acids, both widely used in the plastics industry.

The extraction processes used in the industrialization of sisal waste give off methane gas in considerable quantities, and this might serve as a basis for the manufacture of carbon tetrachloride and chloroform production.

The ample availability of the sisal raw material (the trees grow by the millions in the North-East, as well as in other parts of Brazil), the multiplicity of industrial application for the residues (some of which are already being developed commercially in other parts of the world), and the fact that both power and a growing market for industrial products will shortly be opened up by the Paulo Afonso development, should make further industrialization of sisal, in addition to extraction of its fibers, worthy of investment study.

Sisal Flourishes in N-E Brazil

Sisal plants in their native habitat. The sisal plant, originally introduced from Africa, flourishes in the North-East of Brazil, especially in the State of Paraíba. Being xerophytic, it is ideal for a dry climate. The plant is related to the pineapple. *Photo by Charles Perry Weimer.*

OPPORTUNITIES IN BRAZILIAN TRADE

The Brazilian Government Trade Bureau has received the following inquiries from businessmen in Brazil, who desire to export or import the products listed below. These inquiries are published as received and no representation is made as to standings of listed firms. We suggest that the parties interested write directly to these firms, via airmail, as well as to this office, at 551 Fifth Avenue, New York 17, N. Y.

BUYERS WANTED

BRAZILIAN TIMBER, MATTE. Lino T. Ravaglio, Rua Quinze de Novembro 266, 4.° andar, conjunto 45, Curitiba, Paraná, Brazil.

MINERAL ORES: SCHEELITE, BERYLIUM, COLUMBIUM, TANTALITE. Cia. Nacional de Planificação e Investimentos do Brasil, NACIBRA, S.A., Avenida Guararapes 86, 7° andar, salas 701/4, Recife, Pernambuco, Brazil.

TANNED CROCODILE HIDES, especially bêige and brown, complete skins and legs, tails, jaws, etc. Arieta & Cia., Rua Alfandega 165, Rio de Janeiro, Brazil.

BRAZILIAN TIMBERS of various types. **BRAZIL** Timbers Ltda., Avenida Batel 1137, Curitiba, Paraná, Brazil.

HARDWOOD LOGS, SLEEPERS, etc. Alto Tapajóz, S.A., Rua Gaspar Viana 16/18, Belém, Pará, Brazil.

CASHEW NUTS, PINEAPPLES, DECORATIVE POTTERY, COTTON AND WOOLEN PIECE GOODS. Companhia de Importação e Exportação, Ed. Vieira da Cunha, 2.° andar, Recife, Pernambuco, Brazil.

BRAZILIAN PINE. Fioravante Paese & Filhos Ltda., Rua 25 de Dezembro, 148, Porto Alegre, Rio Grande do Sul, Brazil.

SHELLED and **UNSHELLED PEANUTS, PEANUT MEAL, FIRST PRESSING CASTOR OIL, IPECACUANHA ROOT** (Mato Grosso and Minas qualities), **BEESWAX** and all kinds of **ANIMAL BY-PRODUCTS.** Di Caro Internacional Sociedade Importadora Ltda., Rua Barão de Itapetininga 140, 8.° andar, São Paulo, Brazil.

MEDICINAL PLANTS, ROOTS AND BEANS, from the Amazon. Alfredo Magalhães, Avenida Carvalho Leal 1187, Manaús, Amazonas, Brazil.

TANNED CROCODILE, SNAKE, and **LIZARD SKINS,** etc., **SEMI-MANUFACTURED BELTS (ALLIGATOR AND SNAKE ROLLS), AND FINISHED LEATHER PRODUCTS.** Fábrica de Artefatos de Couro Berco Ltda., Rua dos Inválidos 185, 1.°, Rio de Janeiro.

BRAZILIAN PINE and **HARDWOODS** from own timber yards, through ports of São Francisco do Sul, Paranaguá and Itajaí, Brazil Timbers Ltda., Caixa Postal 966, Curitiba, Paraná, Brazil.

PRECIOUS, SEMI-PRECIOUS STONES, BRAZILIAN SPECIALTIES. H. Stern, Avenida Rio-Branco 173, 14.°, sala 1403, Rio de Janeiro, Brazil.

OURICURY WAX. Ribeiro, Santos & Cia., Ltda., Caixa Postal 434, Salavador, Bahia, Brazil.

BABASSÚ KERNELS, CASHEW NUTS, CARNAUBA WAX, TUCUM NUTS, CASTOR BEANS, HIDES AND SKINS. Sociedade Norte Sul de Representações Ltda., Rua 14 de Julho, 88-altos, São Luiz, Maranhão, Brazil.

COFFEE, OIL SEEDS, COTTON, WAXES, OILS, SLATE, IRON ORE, MICA, etc. Cia. de Pesquisas e Mineração do Vale do Paraíba, S.A., Praça da Sé 184, 10.°, São Paulo.

BRAZILIAN PINEWOOD. A. G. Pimenta & Cia., Avenida Dr. Vicente Machado 404, Ponta Grossa, Paraná, Brazil.

SISAL and CAROÁ FIBERS, CASTOR SEED. J. Bandeira & Cia., Caixa Postal 287, Salvador, Bahia, Brazil.

SELLERS WANTED

AUTOMOBILES, REFRIGERATORS, HEAVY MACHINERY, TYPEWRITERS, CALCULATING MACHINES, DOMESTIC UTENSILS, IRON, STEEL, BARBED WIRE, CHEMICAL PRODUCTS, FERTILIZERS. Cia. Nacional de Planificação e Investimentos do Brasil, NACIBRA, S.A., Avenida Guararapes 86, 7° andar, salas 701/4, Recife, Pernambuco, Brazil.

INDUSTRIAL MACHINERY, ELECTRIC MOTORS, GENERATORS, ETC. Alto Tapajoz, S.A., Rua Gaspar Viana 16/18, Belém, Pará, Brazil.

INDUSTRIAL CHEMICALS, MACHINERY, INDUSTRIAL ACCESSORIES IN GENERAL. Companhia de Importação e Exportação, Ed. Vieira da Cunha, 2°, Recife, Pernambuco, Brazil.

INDUSTRIAL EQUIPMENT FOR LEAD MINING, and INDUSTRIAL RAW MATERIALS such as ZINC, CAUSTIC SODA, SULPHUR. Plumbum, S.A., Industria Brasileira de Mineração, Rua Visconde de Inhauma 58, 13.°, sala 1301, Rio de Janeiro, Brazil.

SODA, WIRE, IRON, LIME, CEMENT, HARDWARE, SODA ASH, PITCH, TURPENTINE, etc. Albano da Costa — Representações, S. A., Caixa da Costa—Representações, S.A., Caixa Postal 1156, São Paulo, Brazil.

AGRICULTURAL AND INDUSTRIAL MACHINERY, CHEMICALS, TINPLATE, RAW MATERIALS IN GENERAL. E. Ozorio de Albuquerque, Caixa Postal 4213, Rio de Janeiro, Brazil.

REPRESENTATIVES

MANUFACTURERS or EXCLUSIVE EXPORTERS of BLACK SHEETS and STAINLESS STEEL SHEETS are offered exclusive representation by Comercial e Importadora Los Andes, S. A., Caixa Postal 5.600, São Paulo, Brazil.

U. S. mines or exclusive exporters of **COAL and FOUNDRY COKE** are offered exclusive representation by Importex Comércio e Representações Ltda., Rua do México 45, sala 306, Rio de Janeiro, Brazil.

Manufacturers or exclusive exporters of **PRINTING EQUIPMENT** and **GLASSWARE** are offered exclusive representative by Comissária Geral "PIRAGIBE" Ltda., Caixa Postal 32, João Pessôa, Paraíba do Norte, Brazil.

Manufacturers or exclusive exporters of **SURGICAL SUPPLIES, CLINICAL THERMOMETERS, BAROMETERS, HYPODERMIC SYRINGES, PHOTOGRAPHIC MATERIALS, and FISHING and HUNTING GOODS** are offered representation by Álvaro Mariano Ornellas, Rua João Pinheiro 226, Uberaba, Minas Gerais, Brazil.

Manufacturers and exporters of **WHEAT, WHEAT FLOUR,** especially with 12 to 13% **PROTEIN,** are offered representation by A. Braga, Edificio Sael, 3.°, sala 310, Recife, Pernambuco, Brazil.

Manufacturers of **GALVANIZED SHEETS, TUBES, WELDING RODS, PHOTOGRAPHIC PAPER, FILMS, X-RAY FILM,** etc., are offered representation by Lino T. Ravaglio, Rua Quinze de Novembro 266, 4°, Conjunto 45, Curitiba, Paraná, Brazil.

Manufacturers of **DIESEL** and **GASOLINE MOTORS, ROAD-BUILDING EQUIPMENT** and **MACHINE TOOLS** are offered representation by Premier Importadora e Exportadora, Ltda., Caixa Postal 6020, São Paulo, Brazil.

Manufacturers or exporters of **GALVANIZED, STAINLESS, SILICON, BLACK,** and **COLD** and **HOT-ROLLED STEEL SHEETS** are offered representation by A. Noqueira Gurgel, Praça Clovis Bevilacqua 495, São Paulo, Brazil.

Manufacturers or exporters of **AUTOMOBILE, AIRPLANE** and **TRACTOR PARTS** are offered representation by Fioravante, Paese & Filhos Ltda., Rua 25 de Dezembro 148, Porto Alegre Rio Grande do Sul, Brazil.

MISCELLANEOUS

ADVERTISING. Services of a complete organization are offered to foreign companies in connection with their interests in Brazil. Fidelitas Publicidade & Propaganda Ltda., Caixa Postal 4730, São Paulo, Brazil.

FOR SALE 8,000 ACRE RANCH, near Anápolis, State of Goiaz, Brazil. 20.000 Coffee trees, large pastures, forests and rivers. Gold, rutile, etc. Nice climate. For further details, please write to: Honorato Menon, Agronomist, Caixa Postal 8790, São Paulo, Brazil.

BRAZILIAN MANUFACTURER of **ROOFINGS,** building products and floors, wishes to contact U.S. manufacturer of similar materials, as well as plastic and synthetic resin articles, interested in Brazilian market. Letters and pamphlets to Ind. de Impermeabilisantes Paulsen Ltda., Caixa Postal 595, Rio de Janeiro, Brazil.